

# **MERRIAM MOUNTAINS SPECIFIC PLAN**

## **APPENDIX Q**

### **FINAL MINERAL RESOURCE REPORT**

GPA 04-06; SP 04-006; R04-013; VTM5381; S04-035, S04-036, S04-037,  
S04-038; Log No. 04-08-028; SCH No. 2004091166

*for the*

### **DRAFT ENVIRONMENTAL IMPACT REPORT**

**August 2007**

**Note: This appendix reflects project details current at the time the August 2007 Draft EIR was distributed for public review. As noted in the preface to the March 2009 Recirculated EIR, some project details and analysis have changed since that time and those details are reflected in the Recirculated EIR and appendices.**

**MERRIAM MOUNTAINS SPECIFIC PLAN**

**FINAL MINERAL RESOURCE REPORT**

**April 6, 2007**

*Prepared for:*

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*Prepared by:*

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FINAL MINERAL RESOURCE REPORT,  
MERRIAM MOUNTAINS PROPERTY,  
SAN DIEGO COUNTY, CALIFORNIA

Prepared For:

**NNP-STONEGATE MERRIAM, L.L.C.**

27071 Cabot Road, Suite 106  
Laguna Hills, California 92653

Project No. 040084-003

January 12, 2005  
(Revised April 6, 2007)



Leighton and Associates, Inc.

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January 12, 2005  
(Revised April 6, 2007)

Project No. 040084-003

To: NNP-Stonegate Merriam, L.L.C.  
27071 Cabot Road, Suite 106  
Laguna Hills, California 92653

Attention: Mr. Joseph Perring

Subject: Final Mineral Resource Report, Merriam Mountains Property, San Diego County, California

In accordance with your request, we have performed a geotechnical review and prepared this Mineral Resource Report for the Merriam Mountains property located in San Diego County, California. Based on the results of our research and review, the site is similar to much of northern San Diego County in that it is underlain by granitic and metavolcanic rock that could possibly be mined and processed and utilized as a source of sand, gravel, and rock. We note that an abandoned quarry is also present on the site and the site has been classified by the State of California as Mineral Resource Zones MRZ-3 and MRZ-2 which indicates the potential for mineral resources in the form of aggregate materials. While the proposed development will encroach into these areas, the majority of the "mapped" areas remain as open space.

If you have any questions regarding our report, please contact this office. We appreciate this opportunity to be of service.

Respectfully submitted,

LEIGHTON AND ASSOCIATES, INC.

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Distribution: (1) Addressee  
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APPENDIX A - REFERENCES





## 1.0 INTRODUCTION

### 1.1 Purpose and Scope

In accordance with your request and authorization, this report presents the results of our review and assessment of the mineral resources for the approximately 2,300-acre Merriam Mountains property in northern San Diego County. The scope of services included:

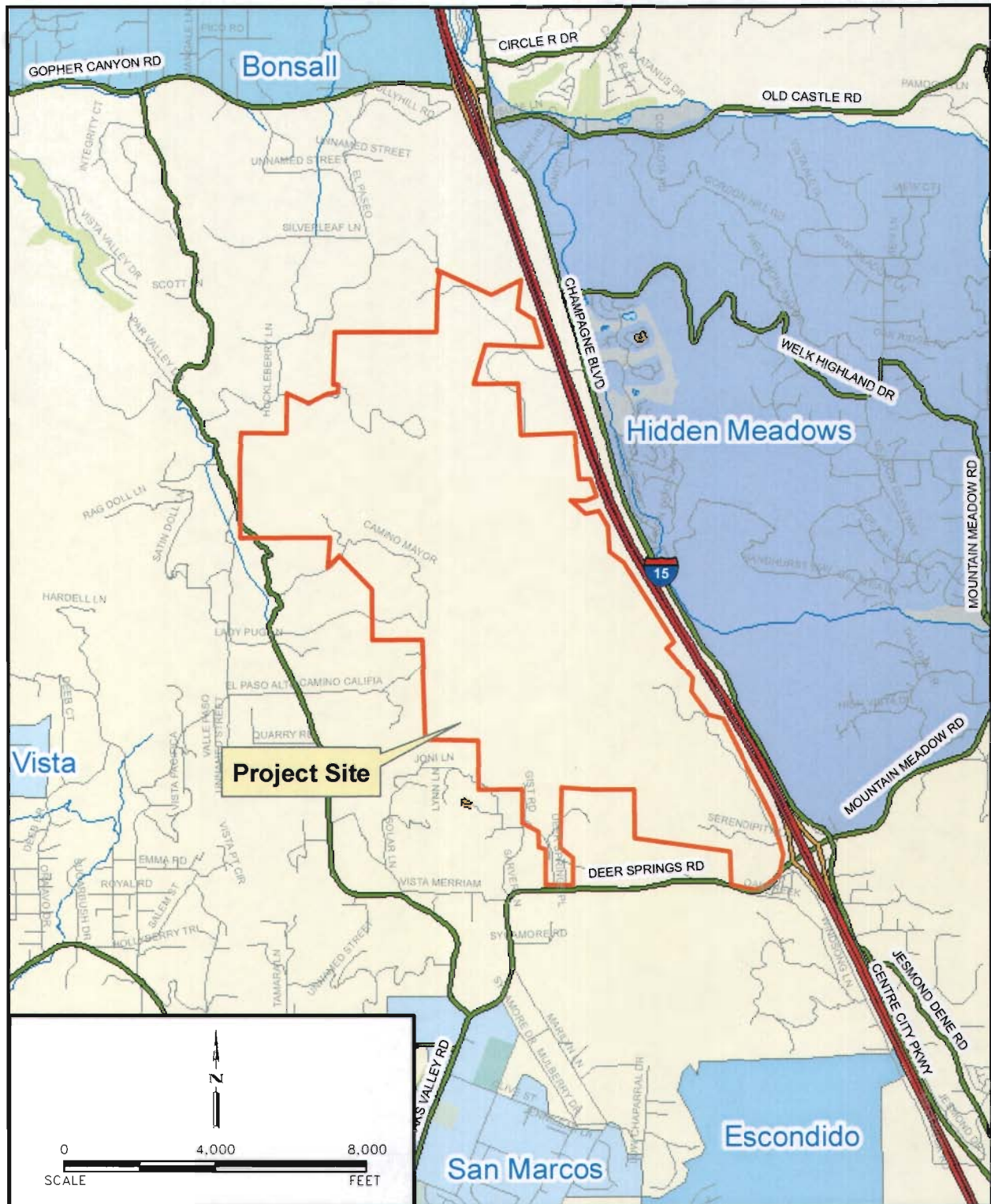
- Review of published literature (Appendix A), documenting the historic and present mineral resources existing at the site.
- Discussion of the site's classification as a Mineral Resource Zone (MRZ-2 and MRZ-3), by the State geologist, and the related S82 (extractive use) zonation of the portion that includes the abandoned quarry.
- Review of our geologic data acquired during our prior geotechnical reviews of the property, including field mapping of bedrock units, boulder outcrops and surficial soil deposits, and conducted a rippability/seismic refraction study to evaluate the approximate seismic velocities of the rock material within anticipated excavation areas.
- Review of comments prepared by the County of San Diego, Department of Planning and Land Use and incorporation of those comments into this report.
- Preparation of this mineral resource assessment report presenting the findings of our study and providing conclusions relative to the mineral resources of the site and the potential impacts posed by the proposed development.

### 1.2 Site Description

The property is generally located west of Interstate 15, bound by Deer Springs Road to the south and Lawrence Welk Lane to the north, in an area of San Diego County named the Merriam Mountains (Figure 1). Topographically, the site generally consists of moderate to steeply sloping hillside terrain with localized valleys and gently sloping terraces. Elevations range from a high of approximately 1,765  $\pm$  feet mean sea level (msl) in the west-central portion of the site to a low of 800  $\pm$  feet (msl) along the southerly site boundary. Granitic rock outcrops dominate the elevated areas at the site.



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Base Map: GDT- TeleAtlas Street Data 2005

## Merriam Mountains Development

San Diego County, California

## SITE LOCATION MAP

Project No.

040084-003

Date

November 2006



Figure No. 1

Generally, natural drainage is presently accomplished through a network of narrow steep-sided canyons in all directions away from the approximately central, northwesterly trending ridgeline. The largest canyon on the site is located along the southerly site boundary and drains in a southward direction. Vegetation on the site ranges from native grasses and weeds in the relatively flat areas canyon bottoms to moderate to thick chaparral on the upper elevations. An abandoned rock quarry is located at the west margin of the property.

### 1.3 Proposed Project

The Merriam Mountains Specific Plan proposes to develop a master-planned community integrating residential, commercial, recreational and open space land uses. The project will allow a maximum of 2,700 dwelling units with an overall density of 1.03 dwelling units per acre within the 2,327-acre area. Residential density within the planning areas ranges from 0.5 dwelling units per acre to 20.0 dwelling units per acre. In addition, the project would also include neighborhood commercial uses, parks, trails, open space areas and associated community facilities and infrastructure.

It is anticipated the localized development areas will be primarily located in the flatter site areas with cuts in the higher elevations and fill areas anticipated in lower site areas. Deer Springs Road is anticipated to be widened south of the project area. Proposed grading and improvement plans for this widening are not yet finalized. Figure 2 (rear of text) illustrates a preliminary development plan, with approximate parcel boundaries, over an aerial photographic base.



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## 2.0 GEOLOGIC SUMMARY

### 2.1 Regional Geologic Setting

The site is located within the coastal subprovince of the Peninsular Ranges Geomorphic Province, near the western edge of the southern California batholith. The topography at the edge of the batholith changes from the rugged landforms developed on the batholith to the more subdued landforms, which typify the softer sedimentary formations of the coastal plain. Primarily, the site is underlain by the Cretaceous-aged Granite of the southern California batholith with minor amounts of Jurassic-aged metavolcanic rock along the western margin. Erosion and regional tectonic uplift created the valleys and ridges of the area.

### 2.2 Site-Specific Geology

Based on our site visit and review of our referenced geologic maps (Appendix A), the primary bedrock unit onsite is Cretaceous-aged Granitic rocks, with Jurassic-aged Metavolcanic rock present along the western margin (Figure 3). As shown on the Regional Geologic Map (Figure 3) the vast majority of the site is underlain by the light colored, resistant granitic rock (Map symbol - Kmm) characteristic of the granodiorites generally mapped along across much of the I-15 corridor and eastward (Weber, 1968, CGS, 1996a). As shown on the Regional Geologic Map (Figure 3), the metavolcanic rocks (Map symbol - Mzu) mapped at the western margin of the property separate the site from the darker colored gabbroic rocks (Map symbol - Kgb) characteristic of the San Marcos Mountains to the west of the site. These units are in turn overlain by surficial units consisting of colluvium, slope wash and minor undocumented fill soils. Surficial soil deposits generally consist of relatively fine-grained material and are limited in aerial extent.

As part of our prior geotechnical review of the property, we have performed site specific geologic mapping and subsurface investigations at the site (Leighton, 2000 and 2004). We have referenced our geotechnical/mapping of the site as part of this review. Note that because we have completed geologic mapping and surface investigations for geotechnical purposes, these investigations are of greater detail than prior investigations of the site by others (Appendix A).

A brief description of the geologic units encountered on the site is presented below:

#### 2.2.1 Surficial Deposits

Undocumented fill soils were observed in a number of places on the site. As observed, the undocumented fill soils were generally associated with the grading of the onsite dirt roads and water tower pads. In general, these undocumented fill soils



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were found to be relatively limited in extent. Deposits of artificial fill were mapped at the western property margin, associated with quarry operation located there.

Topsoil/colluvium mantles the mid- to lower-portions of the hillsides across the majority of the site. It consists of light brown to brown, damp to moist, loose to medium dense, silty to clayey, fine to very coarse sand. These soils are typically massive, porous and contained scattered roots and organics. The potentially compressible topsoil is estimated to be approximately 0 to 2 feet thick. Localized areas of thicker accumulations of topsoil may be encountered. On hillsides of higher elevation, topsoil is minimal, although locally thicker soil/colluvial profiles were encountered in the flatter areas in the lower elevations of the site.

#### 2.2.2 Quaternary Alluvium

Quaternary-aged alluvium is present in the bottom of the canyons and drainages on the site. Similar to colluvial deposits, these soils are generally thin (less than 3 feet) where identified by our prior subsurface investigations and field mapping. Significant thicknesses of alluvial deposits have been identified within the following areas: 1) the northwestern canyon near the crude abandoned runway (3 to 10 feet); 2) the elevation northeast-southwest trending canyon within the southwestern portion of the site, and 3) the main canyon (accessed by Sarver Lane to the south of the site (over 17 feet). The most significant thicknesses are located off site, within drainages which descend from the project site.

It should be noted that alluvial soils likely underlie all of the onsite canyons, but in the upper elevations of the site were considered to be too narrow in lateral extent to be mapped. These soils typically consist of brown, damp to wet, loose to medium dense/stiff, silty sands, sandy clays and silty clays. The alluvium is also considered to be moderately porous and usually contains localized zones of moderate to abundant roots and other organic matter.

#### 2.2.3 Cretaceous Granitic Rock

Granitic rock outcrops were observed across the vast majority of the site and granitic rock underlies the site at depth where not exposed at the surface. The material generally consists of medium to coarse-grained quartz-rich granite rock. They are subdivided based on composition to be part of the Woodson Mountain Granodiorite, commonly exposed elsewhere along the length of the I-15 corridor (CGS, 1996a). More recent mapping (CGS, 2005) further identifies the granitic rock as a monzogranite that comprises Merriam Mountain and the areas northeastward, opposite the I-15 corridor (Figure 3).



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Based on our investigation, large granitic boulders characterize the outcrops in the upper regions of the site, while in the mid- to lower-regions of the site, weathered granitic material was observed in road cuts below the topsoil/colluvium. The weathered granitics generally consists of light gray to light red brown, damp, dense, fine to coarse sand with localized residual boulders throughout. As observed in our trenches and existing road cuts, the depth of highly weathered rock varied from inches to less than 1 to 7 feet below the ground surface or bedrock contact where these material are buried. The seismic traverses performed at the site and observation of existing cut slopes also substantiates the very dense nature of the on site bedrock.

#### 2.2.4 Cretaceous Gabbroic ("Black Granite") Rock

West of the Merriam Mountains Property, mid-cretaceous aged gabbro (Map unit : Kgb) is mapped (Figure 3). Characteristic of the San Marcos Mountains, this gabbro includes the "Black Granite" valuable as a dimension stone and unique to San Diego County (Wood, 1974). This map unit is limited to areas west of Twin Oaks Valley Road and is therefore located within an area designated as Biological Open Space.

#### 2.2.5 Jurassic-Cretaceous Metavolcanic Rock

Metavolcanic rocks are mapped within a narrow band along the western margin of the subject site, including the quarry area (Figure 3). This relatively variable unit consists of schist, quartzite, argillite, gneiss, and meta-basalt (CGS, 1996 and 2005). These metamorphosed rocks represent the older rocks, intruded and altered by the young Cretaceous-aged Granitics (Kgr), and tend to be less resistant to weathering. These rocks generally form more subdued, erodible topography than the adjacent Cretaceous granitic rocks mapped to the east and west.

### 2.3 Geologic Structure

Based on our prior site reconnaissance/geologic mapping, the materials on site are generally massive with no distinctive structure. Some regional foliation and/or fracturing can be observed during aerial photographic analysis. Jointing in localized areas within the weathered granitic rock can also be observed in the field.

In the western portion of the site, a contact (intrusive margin) is mapped where the Cretaceous-aged granitic rocks are in contact with the older Mesozoic metavolcanic rocks. The location of the abandoned quarry in this area (Figures 2 and 3) implies that the rocks limited to this margin had qualities which made them desirable for extraction.



### 3.0 MINERAL RESOURCES

#### 3.1 Mineral Land Classification

As mandated by the Surface Mining and Reclamation Act of 1975, the California State Mining and Geology Board classifies California mineral resources with the Mineral Resource Zones (MRZs) system. These zones have been established based on the presence or absence of significant sand and gravel deposits and crushed rock source area, e.g., products used in the production of cement. The classification system emphasizes Portland Cement Concrete (PCC) aggregate, which is subject to a series of specifications to ensure the manufacture of strong durable concrete. The following guidelines are presented in the mineral land classification for the region (CGS, 1982 and 1996b).

- MRZ-2 - Areas where adequate information indicates that significant mineral deposits are present or where it is judged that there is a high likelihood for their presence.
- MRZ-3 - Areas containing mineral deposits, the significance of which cannot be evaluated from available data.
- MRZ-4 - Areas where available information is inadequate for assignment to any other MRZ zone.

Within western San Diego County, which includes the site, the extent of zones classified as MRZ-2 are shown in blue on the Figure 4 (Rear of Text). The vast majority of existing MRZ-2 zones are mapped in alluvial areas and therefore have irregular, organic limits defined by low-lying topographic drainages. Geologically, these areas are generally characterized by the presence of younger (Quaternary-aged) river channel, floodplain, and terrace deposits that have been eroded from the older (Tertiary to Cretaceous-aged) bedrock units, transported, and re-deposited. They consist of naturally loose mixtures of sands and rounded gravels. Laboratory testing has also confirmed the physical and chemical characteristics of the deposits are appropriate for PCC-grade aggregate.

In contrast, Merriam site is entirely different in that it is a granitic rock site, with MRZ-2 boundaries not defined by geologic unit limits, but property lines. The majority of the San Diego region is mapped as a MRZ-3 zone (Figure 4). Generally, these areas geologically consist of the older bedrock units, including the crystalline and metavolcanic rocks that are mapped over nearly two thirds of the San Diego County. These areas are also commonly rugged mountainous terrain relatively isolated from existing development and infrastructure. As noted in the updated 1996 DMG classification report, these materials can be crushed to yield PCC-grade aggregate provided they possess the appropriate chemical characteristics. Despite considerable costs associated with crushing, additional processing, and transportation, crushed rock has been a feasible source when more economical alluvial materials are not readily available.





Reclassification of an MRZ-3 zone to a MRZ-2 designation is under the purview of the California State Geologist. The criteria includes determination that the “deposit is minable, processable, and marketable under the technologic and economic conditions that exist at present or which can be estimated to exist in the next 50 years and meets or exceeds (in 1996 equivalent dollars) \$12,150,000 for Construction materials (DMG, 1996b). Note this equated to \$5,000,000 in 1978 dollars when the guidelines were first written.

### 3.2 Merriam Mountains Property

As shown on Figure 2, the Merriam Mountains site includes areas zoned as MRZ-2 and MRZ-3. Because it consists of a mountainous terrain as opposed to an alluvial river valley, the site’s resource designations result from the presence of crystalline and metavolcanic rocks which, when crushed to suitable sizes, could be considered for construction material in the form of aggregate materials.

Note that the MRZ-2 zone includes two parts. The first (Quarry Parcel) area to the west was originally designated as MRZ-2 in the first classification, California Division of Mines and Geology Special Report 153 (CGS, 1982). This MRZ-2 area is also zoned for extractive use (S82) by the County of San Diego. Within this area, a quarry operation was previously in operation. This site, known as the Twin Oaks Quarry, was historically permitted for aggregate mining by South Coast Asphalt Products. Although they had a use permit for quarrying of rock from the site, they were not permitted to crush, screen wash the quarried rock (CGS, 1982).

Also outlined on Figure 2, the Sycamore Ridge Parcel was reclassified as MRZ-2 in response to a petition by HG Fenton Material Company (CGS, 1988). Based on this report, data was utilized to indicate the on-site fresh granitic materials meet quality standards for PCC-grade aggregate.

As part of the evaluation process, the California Geologic Survey (formerly Division of Mines and Geology) documented that the volcanic rock within the MRZ-2 zoned area is minable, processable, and marketable under the present (1996) and near future technologic and economic conditions. Furthermore, it meets or exceeds the lower threshold value of \$12,150,000 for construction materials (1996 equivalent dollars).

The composite area, classified as MRZ-2, was later acquired by Hanson, Aggregate/Pacific Southwest (COGS, 1997-1998). All plans for reactivation of the mine or further exploration were discontinued (North County Times, 2002). It appears that the “mining out” of the existing excavation, along with adverse impacts to the adjacent residential developments and sensitive environmental habitat with increase traffic, noise, etc., along with the limited extent of the mine able aggregate resource, influenced the decision to abandon this quarry.



## 4.0 CONCLUSIONS

### 4.1 Project Impacts

Figure 2 illustrates the Merriam Mountain property limits with the proposed project graded area shown, consisting of a series of developed parcels across the central and southern area, and a roadway across the northern area (Fusco, 2006). The quarry site is easily identified the unvegetated (white to light gray) area to the northwest of the proposed development areas, within the county designated S-82 limits. The proposed project overlaps the state-designated MRZ-2 zone, where a roadway (North Tank Road) and northern portion of the residential development area extend into the Sycamore Ridge parcel. The development of the proposed project would clearly effect the future extraction of the mineral resources in and around this area.

#### 4.1.1 Assumptions

In order to quantify these affects for environmental impact purposes, the following assumptions are made pertaining to the project and mineral resources within a foreseeable near-future (<50 year) time frame.

- Although it is not guaranteed due to unforeseeable technologic and economic factors, *the minimum value of the construction materials (PCC-grade aggregate) continues to exceed \$12,500,000 (in 1996 equivalent dollars)*, and therefore the MRZ-2 designation remains valid per any updated criteria of the State of California Geologist.
- *The abandoned quarry does not represent an entirely exhausted resource.* Although evidence suggests it is no longer viable, it is considered revivable considering the possibility of future changes in technologic and economic conditions.
- Our prior investigation indicates very hard granitic rock underlies the site at relatively shallow depths. Seismic refraction profiles indicate accelerations averaging over 11,000 feet per second at a depth of 15 to 25 feet. Therefore, any mining of materials below the surface would necessitate blasting, as accelerations over 7,000 feet per second are generally considered “unrippable” with earthwork equipment. *Therefore, a quarry operation would likely consist of blasting to recover more than the surficial deposits of the site.*
- Although it does not appear to be the case at the current time, *a quarry operation is assumed to be unhindered by environmental constraints posed by noise, pollution, trucking traffic, etc.* The future permitting of the MRZ-2 area



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for resource extraction is assumed to be feasible. Any restrictions similar to those that have evidently adversely affected the further use of the existing quarry and surrounding area are not factors.

#### 4.1.2 Scenario 1- Loss of Overlapped Area

The size of the MRZ-2 zoned area available for eventual extraction would be reduced by the development of the proposed project where it overlaps on the southeast corner of the Sycamore Ridge Property. This area includes a calculated 77.36 acres lost to the residential development and 30.36 acres for the location of the North Tank Road. This overlap area is on the order of approximately 15% of the total 709-acre area designated as MRZ-2. However, a greater area would be affected in order to provide a buffer of separation between the proposed development and a hypothetical extractive use program designed elsewhere across the Sycamore Ridge parcel. The quarry area is situated on a west facing slope adjacent to a north-south trending proposed road, which provides its access, and is separated from the Sycamore ridge parcel by a large topographic high. Under this scenario, the quarry area currently zone S-82 for extractive use, is not being developed and its access (from the west) is not affected by the proposed development.

#### 4.1.3 Scenario 2- Entirety of the MRZ-2

The 709-acre area zoned MRZ.-2 includes the Sycamore Ridge parcel and the Quarry parcel, with approximated areas of 482 and 227 acres, respectively. It should be considered that under certain planning scenarios not able to be predicted within the scope of this report, the proposed development would serve as an additional negative influence on any future extractive uses in the quarry and surrounding area. Under this scenario, the entirety of the 709-acre area, including the area currently zoned as S-82 for extractive use, would not be available for extraction.

#### 4.2 Significance

Based on the results of research and review, the site is similar to much of northern San Diego County in that it is underlain by granites and met volcanic rock that could possibly be mined and processed and utilized as a source of sand, gravel, and rock. As the site is similar to much of the regional area, it is not unique in this regard. Our geotechnical studies of the site, including mapping and seismic refraction profiling (Leighton, 2000 and 2004) indicate the limited extent of workable surficial and alluvial deposits, and the very hard (unrippable) nature of the underlying granitic rock. To the west of Twin Oaks Valley Road, an area approximately 40 acres in size is mapped as Gabbroic rock, and therefore may include the



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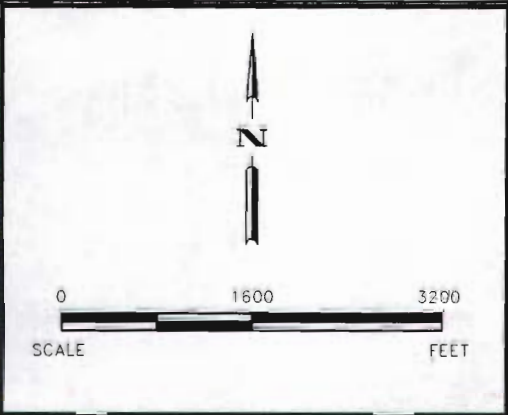
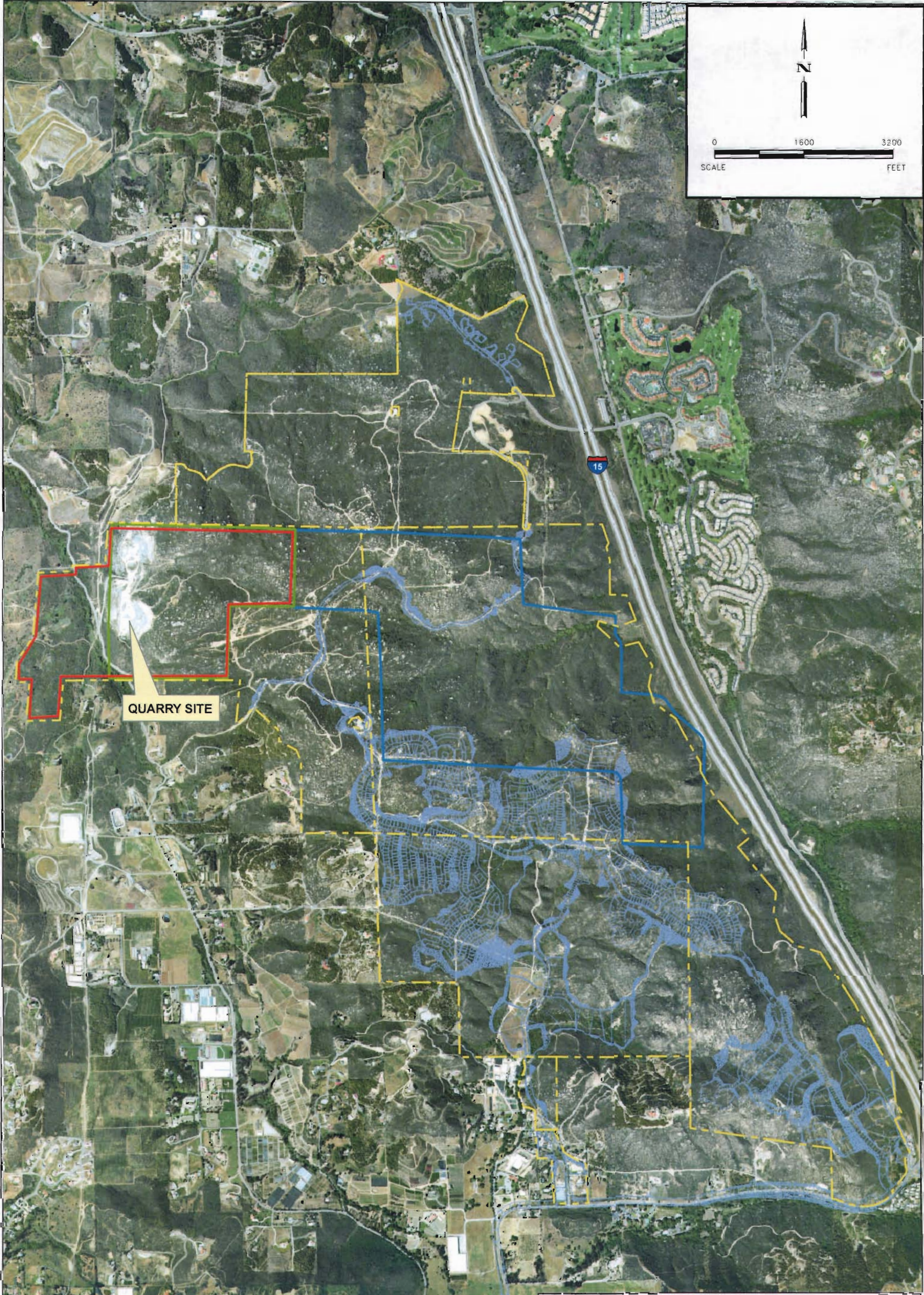
so-called "Black Granite" historically utilized as a dimension stone. Designation of this area as Biological Open Space may limit the possibilities for future extraction in the area west of Twin Oaks Valley Road. However, the current development plan is favorable in that the areas designated for grading and commercial/residential development are entirely underlain by the more common light-colored granitic rock relatively common in the region.

While the site is categorized as MRZ.-2 and MRZ.-3, the property is not being used currently for extraction. With the widespread nature of similar hard rock geology comprising most of eastern San Diego County, the site is not viewed as a unique critical resource as a source of PCC-grade aggregate. Areas similar in geologic composition to the Merriam Mountains site continue to exist as MRZ.-3 zoned areas due to the lack of petition to the state Geologist for redefinition. When quantified relative to the entire extent of similar granites rock exposures found across the eastern San Diego County, site development could be considered of negligible relative loss for PCC-grade aggregate. The gabbroic rocks mapped west of Twin Oaks Valley Road, potentially containing "Black Granite" are relatively less common, and are considered unique to San Diego County. The assumptions and scenarios are presented in Section 4.1 above to attempt to qualify the site as a resource, deferring to its existing designations with the State Geologist (MRZ.-2) and MRZ.-2A) and the County of San Diego (S-82).




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
**Property Overview Map**  
Mineral Resource Zone & Proposed Development Limits  
  
Merriam Mountain Property  
  
San Diego County, California



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Project No: 040084-003  
Produced By: KMT/PM  
Eng/Geol: SAC/MRS  
Date: November 2006  
Figure 2

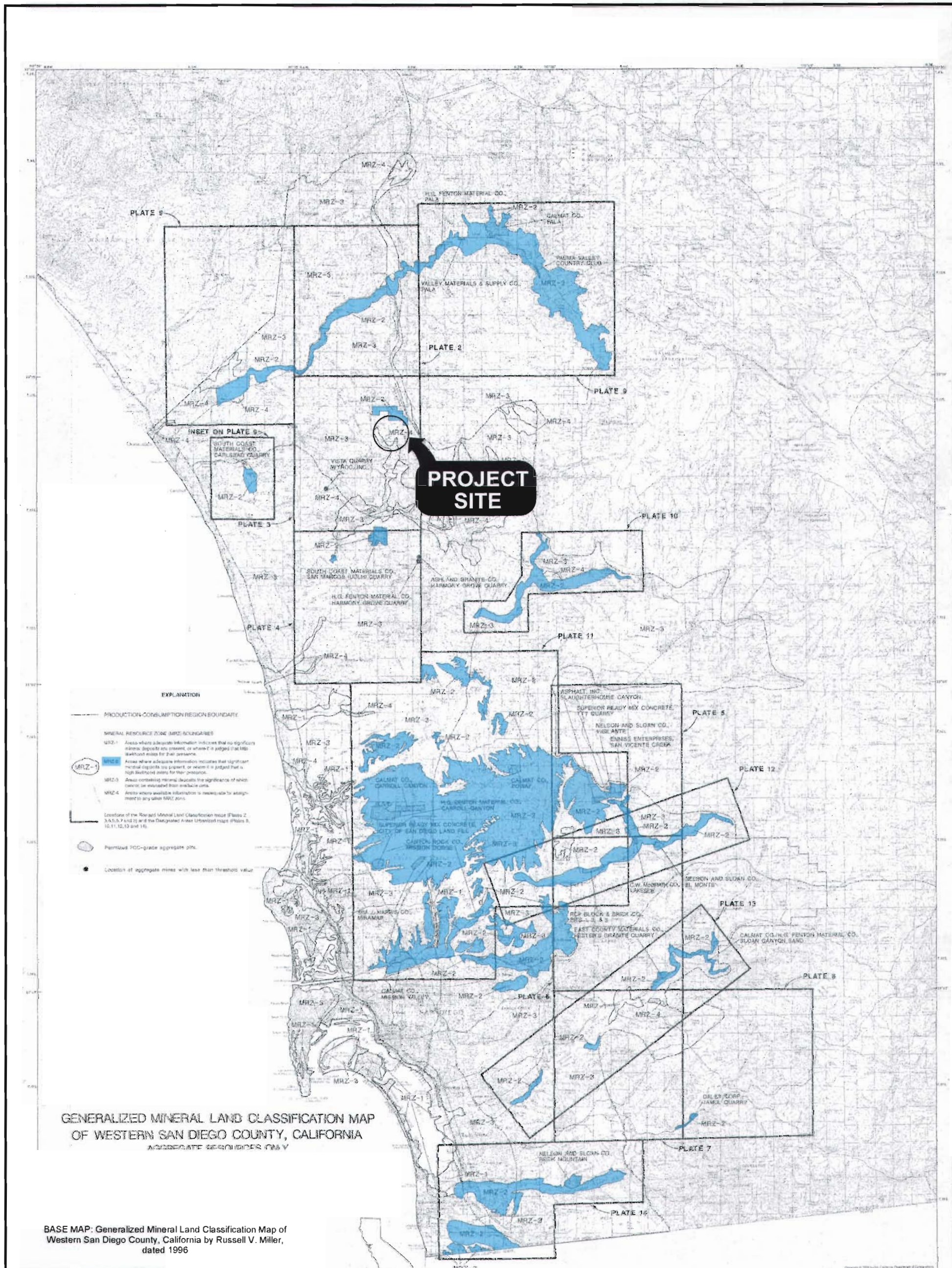
**LEGEND**

-  SITE BOUNDARY
-  Quarry Parcel S-82 Zoned Area
-  Quarry Parcel MRZ-2,  
per DMG Special Report 153 (CGS 1987)
-  Sycamore Ridge Parcel MRZ-2A,  
per DMG Open-File Report 96-04 (CGS 1996)









GENERALIZED MINERAL LAND CLASSIFICATION MAP  
OF WESTERN SAN DIEGO COUNTY, CALIFORNIA  
AGGREGATE RESOURCES ONLY

BASE MAP: Generalized Mineral Land Classification Map of  
Western San Diego County, California by Russell V. Miller,  
dated 1996

## Highlighted Mineral Resource Zones

Designated MRZ-2 (Per California Division  
of Mines and Geology Open File Report 96-04)  
Western San Diego County, California

Project No. **040084-003**  
Scale **Not to scale**  
Engr./Geol. **SAC/MRS**  
Drafted By **KAM/BJO**  
Date **November, 2006**  
Leighton and Associates, Inc.  
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Figure 4



## APPENDIX A

References

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Aerial Photographs

Date	Source	Flight	Photo No(s)
3/31/53	USDA	AXN-3M	126 through 128
3/31/53	USDA	AXN-3M	162 through 165